



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.             | CONFIRMATION NO.       |
|---|-------------|----------------------|---------------------------------|------------------------|
| 10/694,385  | 10/27/2003  | Brian J. Stockman    | 6283.N DV1                      | 5758                   |
| 26813 7590 12/18/2006<br>MUETING, RAASCH & GEBHARDT, P.A.<br>P.O. BOX 581415<br>MINNEAPOLIS, MN 55458 |             |                      | EXAMINER<br>SHIBUYA, MARK LANCE |                        |
|   |             |                      | ART UNIT<br>1639                | PAPER NUMBER           |
| SHORTENED STATUTORY PERIOD OF RESPONSE<br>3 MONTHS  |             |                      | MAIL DATE<br>12/18/2006         | DELIVERY MODE<br>PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/694,385

Applicant(s)

STOCKMAN ET AL.

Examiner

Mark L. Shibuya, Ph.D.,

Art Unit

1639

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 18-20 and 22-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-20 and 22-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/31/06</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Claims 18-20 and 22-30 are pending and examined.

#### ***Priority***

2. This application, filed 10/27/2003, states that it is a Divisional of 09/677,107; filed 9/29/2000; which claims benefit of 60/156,816, filed 9/29/1999; 60/161,682, filed 10/26/1999; and 60/192,685, filed 3/28/2000.

3. The examiner is grateful to the applicant for updating the status of parent application 09/677,107, now US Patent No. 6,677,160, in the first line of the specification.

#### ***Information Disclosure Statement***

4. The information disclosure statement (IDS) submitted on 8/31/2006, was filed after the mailing date of the non-final Office action, mailed 6/26/2006. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

#### ***Withdrawn Claim Rejections***

5. The following rejection(s) are withdrawn in view of applicant's arguments and amendments to the claims.

Art Unit: 1639

6. Claim 29 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.

7. Claim 29 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

***Maintained Claim Rejections - 35 USC § 103***

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Claims 18-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hajduk et al.**, J. Am Chem. Soc. 1997, 119, pp. 12257-12261 (IDS entered 3/1/2004); and in view of **Keifer**, Drugs of the Future 1998, Vol. 23, No. 3, pp. 301-317 (IDS entered 3/1/2004).

This rejection is maintained for the reasons of record as set forth in the previous Office action. The rejection is copied below for the convenience of the reader.

The claims are drawn to a method of identifying a compound that binds to a target molecule, the method comprising: providing a plurality of mixtures of test compounds, each mixture being in a sample reservoir; introducing a target molecule into each of the sample reservoirs to provide a plurality of test samples; providing a nuclear magnetic resonance spectrometer equipped with a flow-injection probe; transferring each test sample from the sample reservoir into the flow-injection probe; collecting a relaxation-edited nuclear magnetic resonance spectrum on each test sample in each sample reservoir; and comparing the spectra of each test sample to the spectra taken under the same conditions in the absence of the target molecule to identify test compounds that bind to the target molecule; wherein the concentration of target molecule and each test compound in each sample reservoir is no greater than about 100  $\mu$ M; and variations thereof.

**Hajduk et al.**, J. Am Chem. Soc. 1997, 119, pp. 12257-12261, throughout the publication and abstract, disclose one-dimensional  $^1\text{H}$  NMR techniques for screening libraries of compounds for binding

Art Unit: 1639

to a macromolecule that is a protein, particularly the FK506 binding protein, ("FKBP"), by relaxation-edited detection of ligand binding; which reads on the instantly claimed method of identifying a compound that binds to a target molecule, the method comprising: providing a plurality of mixtures of test compounds, each mixture being in a sample reservoir; introducing a target molecule into each of the sample reservoirs to provide a plurality of test samples; and collecting a relaxation-edited nuclear magnetic resonance spectrum, as in *claims 18, 23, 24, 30*.

Hajduk et al., at p. 12258, para 2-p. 12259, para 2, teach relaxation-edited 1-dimension NMR detection of ligand binding to mixtures comprising a library of nine compounds containing 2-phenylimidazole, which binds to FKBP with an affinity of 200  $\mu\text{M}$ , (and which absent evidence to the contrary, reads on a dissociation constant of a test compound that binds to the target molecule of at least about 100  $\mu\text{M}$ , as in *claim 29*) and eight compounds that do not bind to the protein, (and wherein these compounds read on test compounds having molecular weights no greater than about 350 grams/mole, as in *claims 22, 25, 26*). Hajduk teach obtaining a relaxation-edited spectrum of the test compounds in the absence of FKBP, then obtaining relaxation-edited spectra of FKBP alone and of the test compounds in the presence of FKBP and subtraction to produce a spectrum (Figure 2B) and to identify, from the difference spectrum (Figure 2c), compounds that bind to FKBP; which reads on collecting a relaxation-edited nuclear magnetic resonance spectrum on each test sample in each sample reservoir; and comparing the spectra of each test sample to the spectra taken under the same conditions in the absence of the target molecule to identify test compounds that bind to the target molecule, as in *claim 18*.

Hajduk et al., at p. 12260, para 2-3, teach samples containing, e.g., 50  $\mu\text{M}$  FKBP protein and 50  $\mu\text{M}$  of each ligand, (which reads on the concentration of the target molecule and each test compound in the sample reservoir being no greater than about 50  $\mu\text{M}$ , as in *claim 28*) or 100  $\mu\text{M}$  stromelysin and 100  $\mu\text{M}$  of each ligand, in a 95%  $\text{D}_2\text{O}$  buffered solution, (wherein the particular compounds taught have, absent evidence to the contrary, solubility in deuterated water of at least about 1mM at room temperature, as in *claim 21*; and wherein the ratio of target molecule to each test compound in the sample reservoir is about 1:1, as in *claim 27*); which reads on the claimed method wherein the concentration of target molecule and each test compound in each sample reservoir is no greater than about 100  $\mu\text{M}$ , as in *claim 18*.

Hajduk et al., does not disclose methods for identifying compounds comprising providing a nuclear magnetic resonance spectrometer equipped with a flow-injection probe; and transferring each test sample from the sample reservoir into the flow-injection probe.

Keifer, *Drugs of the Future* 1998, Vol. 23, No. 3, pp. 301-317, throughout the publication, and especially at p. 308, para 5-p. 313, para 3, teaches probes specifically designed to handle small-volumes (less than 40 microliters), and particularly at p. 311, para 5-p. 312, para 1, teach flow injection NMR by transferring an aliquot of sample from a microtiter plate (also, Keifer, at p. 310, para 2, teaches microtiter plate-based NMR that contemplates 96-well microtiter plates; and as in *claims 19, 20*); which reads on providing a nuclear magnetic resonance spectrometer equipped with a flow-injection probe; and transferring each test sample from the sample reservoir into the flow-injection probe, as in *claim 18*.

It would have been *prima facie* obvious, at the time the invention was made, for one of ordinary skill in the art to have made and used methods for identifying compounds comprising providing a nuclear magnetic resonance spectrometer equipped with a flow-injection probe; and transferring each test sample from the sample reservoir into the flow-injection probe; and to use multiwell and 96-well microtiter plates in such methods.

One of ordinary skill in the art would have been motivated to make and use methods for identifying compounds comprising providing a nuclear magnetic resonance spectrometer equipped with a flow-injection probe; and transferring each test sample from the sample reservoir into the flow-injection probe, because Kiefer teaches transferring test samples from microtiter plates by flow-injection probe to for NMR analysis, is desirable in order to acquire high-quality NMR spectra in a rapid and automated fashion (e.g., Kiefer at p. 310, para 2, pp. 312-313, bridging paragraph), and particularly, to screen combinatorial chemistry compounds or mixtures of compounds in order to speed up the entire drug discovery process (e.g., Kiefer at p. 301, para 1).

One of ordinary skill in the art would have had a reasonable expectation of success in using methods comprising providing a nuclear magnetic resonance spectrometer equipped with a flow-injection

Art Unit: 1639

probe; and transferring each test sample from the sample reservoir into the flow-injection probe, because Kiefer teaches such flow-injection probes were commercially available; (Kiefer at p. 308, para 3, citing the "Nanoprobe" from Varian).

### Response to Arguments

Applicant has amended the claims. Applicant appears to argue that there is no motivation to combine the cited prior art references, save improper hindsight reasoning.

Applicant states:

Although Hajduk et al. may disclose specific test compounds having the desired solubility, and the desired concentrations of target molecule and test compounds, there is no teaching or suggestion that these are important features that contribute to the success of Applicants' method. Recognition of these as important features to utilize in the system of Keifer does not come absent hindsight. Even then, this recognition only occurs when one uses the information provided by Applicants' application, which is inappropriate.

Reply at p. 8.

Applicant's arguments, entered 8/31/2006, have been fully considered but they are not persuasive.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). However, the examiner respectfully submits that the traversal against hindsight

Art Unit: 1639

reasoning is inapposite, in regard to the instant rejection. The secondary reference of Keifer is referenced for the teaching of transferring each test sample from the sample reservoir into the flow-injection probe; *not* because the primary reference of Hajduk et al., *per se*, does not disclose or suggest the compounds of the ligand library.

Furthermore, the primary reference of Hajduk et al., appears to disclose compounds of a ligand library, wherein the compound possess the properties as specified in the claims. The applicant does not argue otherwise or present objective evidence to the contrary. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make physical comparisons therewith. See, *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

Therefore, the examiner respectfully submits that the claimed invention is *prima facie* obvious over the prior art references cited in the instant rejection.

### ***Conclusion***

10. Claims 18-20 and 22-30 stand finally rejected.

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

Art Unit: 1639

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark L. Shibuya, Ph.D., whose telephone number is (571) 272-0806. The examiner can normally be reached on M-F, 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. James Schultz can be reached on (571) 272-0763. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 1639

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Mark L. Shibuya, Ph.D.,  
Primary Examiner  
Art Unit 1639